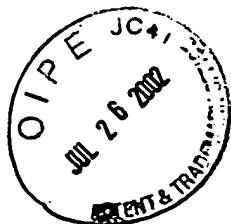


2173



PATENT  
Attorney Docket No. MIT-051CN2  
(5473/53)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS:	Zilles et al.	BATCH NO.:	Not Yet Assigned
SERIAL NO.:	10/055,565	GROUP NO.:	2173
FILING DATE:	October 26, 2001	EXAMINER:	Not Yet Assigned
TITLE:	METHOD AND APPARATUS FOR DETERMINING FORCES TO BE APPLIED TO A USER THROUGH A HAPTIC INTERFACE		

**CERTIFICATE OF FIRST CLASS MAILING UNDER 37 C.F.R. 1.8**

I hereby certify that this correspondence, and any document(s) referred to as enclosed herein, is/are being deposited with the United States Postal Service as first class mail, postage prepaid, in an envelope addressed to the Commissioner for Patents, Washington, DC 20231 on this 23rd day of July 2002.

  
Irja Zarembok

Commissioner for Patents  
Washington, DC 20231

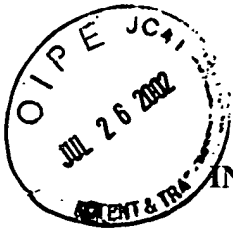
RECEIVED  
JUL 30 2002  
Technology Center 2100

Sir:

Submitted herewith are:

Transmittal Form (1 pg.);  
Supplemental Information Disclosure Statement (2 pgs.);  
Supplemental Form PTO-1449 (5 pgs.);  
Copies of Cited References (A73-A147; B9-B17; C42-C60); and  
Return receipt postcard

2457433



PATENT  
Attorney Docket No. MIT-051CN2  
5473/53

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PRIORITY APPLICATION Serial No. 09/324,137

APPLICANTS:	Zilles et al.	BATCH NO.	Not yet assigned
SERIAL NO.:	10/055,565	GROUP NO.	2173
FILING DATE:	October 26, 2001	EXAMINER	Not yet assigned
TITLE:	METHOD AND APPARATUS FOR DETERMINING FORCES TO BE APPLIED TO A USER THROUGH A HAPTIC INTERFACE		

Commissioner for Patents  
Washington, D.C. 20231

RECEIVED

JUL 30 2002

Technology Center 2100

SUPPLEMENTAL INFORMATION DISCLOSURE

STATEMENT

Sir:

In accordance with the provisions of 37 C.F.R. 1.97 and 1.98, Applicants hereby make of record the patents and publications listed on the accompanying Form PTO-1449, and other information contained herein, for consideration by the Examiner in connection with the examination of the above-identified patent application. Copies of the patents and publications are enclosed.

REMARKS

In accordance with the provisions of 37 C.F.R. 1.97, this statement is being filed:

- ☒ (1) within three (3) months of the **filing date** of a national application other than a continued prosecution application under 37 C.F.R. 1.53(d), or within three (3) months of the **date of entry of the national stage** as set forth in 37 C.F.R. 1.491 in an international application, or before the mailing of the **first Office action** on the merits, or before the mailing of a **first Office action** after the filing of a request for continued examination under 37 C.F.R. 1.114; or
- ☐ (2) after the period defined in (1) but before the mailing date of a final action or a notice of allowance under 37 C.F.R. 1.311, and
- the requisite Statement is below, or  
the requisite fee under 37 C.F.R. 1.17(p), namely \$180.00, is included herein, or
- ☐ (3) after the mailing date of a **final action** or **notice of allowance** but before the payment of

the issue fee, AND

the requisite Statement is below, AND

the requisite petition fee under 37 C.F.R. 1.17(p), namely \$180.00 is included herein.

It is respectfully requested that each of the patents and publications listed on the attached Form PTO-1449, and other information contained herein, be made of record in this application.

#### STATEMENT

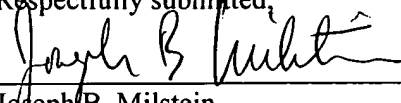
As required under 37 C.F.R. 1.97(e), Applicant(s), through the undersigned, hereby state either that [check the appropriate space only if either (2) or (3) is checked on the previous page and the Statement is required]:

- ☐ 1. Each item of information contained in the Information Disclosure Statement was first cited in any communication from a foreign patent office in a counterpart foreign application **not more than three months** prior to the filing of the Information Disclosure Statement; or
- ☐ 2. No item of information contained in the Information Disclosure Statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing this Statement after making reasonable inquiry, no item of information contained in the Information Disclosure Statement was known to any individual designated in 37 C.F.R. 1.56(c) more than three months prior to the filing of the Information Disclosure Statement

Date: July 23, 2002  
Reg. No. 42,897

Tel. No.: (617) 248-7695  
Fax No.: (617) 248-7100

Respectfully submitted,

  
\_\_\_\_\_  
Joseph B. Milstein  
Attorney for Applicants  
Testa, Hurwitz, & Thibault, LLP  
High Street Tower  
125 High Street  
Boston, Massachusetts 02110

**SUPPLEMENTAL FORM PTO - 1449  
INFORMATION DISCLOSURE STATEMENT**

ATTORNEY DOCKET NO.: MIT-051CN (5473/53)

APPLICANTS: Zilles et al.

SERIAL NO.: 10/055,565

FILING DATE: October 26, 2001

GROUP: 2173

**RECEIVED****JUL 30 2002**

Technology Center 2100

## U.S. PATENT DOCUMENTS

EXAM. INIT.		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	A73	2,475,484	07/01/49	DeNise	318	628	05/14/46
	A74	3,531,868	10/06/70	Stevenson	33	174	04/18/68
	A75	3,920,972	11/18/75	Corwin et al.	235	151.11	07/16/74
	A76	3,944,798	03/16/76	Eaton	235	161.3	04/18/74
	A77	4,216,467	08/05/80	Colston	340	365L	12/22/77
	A78	4,367,532	01/04/83	Crum et al.	364	513	12/24/80
	A79	4,420,808	12/13/83	Diamond et al.	364	434	01/18/82
	A80	4,521,685	06/04/85	Rebman	250	229	03/01/82
	A81	4,638,798	01/27/87	Shelden et al.	128	303B	09/10/80
	A82	4,653,011	03/24/87	Iwano	364	513	03/27/85
	A83	4,670,851	06/02/87	Murakami et al.	364	518	10/22/84
	A84	4,680,519	07/14/87	Chand et al.	318	568	09/23/85
	A85	4,703,443	10/27/87	Moriyasu	364	559	02/07/85
	A86	4,729,098	03/01/88	Cline et al.	364	414	06/05/85
	A87	4,769,763	09/06/88	Trieb et al.	364	559	06/16/86
	A88	4,791,934	12/20/88	Brunnett	128	653	08/07/86
	A89	4,819,195	04/04/89	Bell et al.	364	571.05	01/20/87
	A90	4,823,634	04/25/89	Culver	74	471	11/03/87
	A91	4,853,874	08/01/89	Iwamoto et al.	364	513	11/20/87
	A92	4,942,538	07/17/90	Yuan et al.	364	513	02/23/89
	A93	4,945,305	07/31/90	Blood	324	207.17	04/11/89
	A94	4,945,501	07/31/90	Bell et al.	364	571.05	04/12/89
	A95	4,961,138	10/02/90	Gorniak	364	200	10/02/89



SUPPLEMENTAL FORM PTO - 1449

INFORMATION DISCLOSURE STATEMENT

ATTORNEY DOCKET NO.: MIT-051CN (5473/53)

APPLICANTS: Zilles et al.

SERIAL NO.: 10/055,565

FILING DATE: October 26, 2001

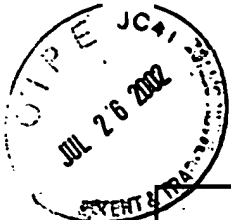
GROUP: 2173

RECEIVED

JUL 30 2002

Technology Center 2100

	A96	4,973,215	11/27/90	Karlen et al.	414	729	02/14/89
	A97	4,982,504	01/08/91	Söderberg et al.	33	502	02/17/89
	A98	5,040,306	08/20/91	McMurtry et al.	33	556	02/20/89
	A99	5,053,975	10/01/91	Tsuchihashi et al.	364	513	06/08/89
	A100	5,088,046	02/11/92	McMurtry	364	474.03	12/19/88
	A101	5,088,055	02/11/92	Oyama	364	560	02/22/90
	A102	5,105,367	04/14/92	Tsuchihashi et al.	395	99	10/16/89
	A103	5,130,632	07/14/92	Ezawa et al.	318	568.11	12/05/90
	A104	5,131,844	07/21/92	Marinaccio et al.,	433	72	04/08/91
	A105	5,185,561	02/09/93	Good et al.	318	432	07/23/91
	A106	5,189,806	03/02/93	McMurtry et al.	33	503	08/17/92
	A107	5,204,824	04/20/93	Fujimaki	364	474.03	08/23/90
	A108	5,220,260	06/15/93	Schuler	318	561	10/24/91
	A109	5,396,265	03/07/95	Ulrich et al.	345	158	09/17/90
	A110	5,414,337	05/09/95	Schuler	318	561	06/11/93
	A111	5,438,529	08/01/95	Rosenberg et al.	364	709.1	01/26/94
	A112	5,555,894	09/17/96	Doyama et al.	128	782	05/02/94
	A113	5,559,412	09/24/96	Schuler	318	561	05/03/95
	A114	5,587,937	12/24/96	Massie et al.	364	578	04/25/95
	A115	5,589,854	12/31/96	Tsai	345	161	06/22/95
	A116	5,623,642	04/01/97	Katz et al.	395	500	04/06/94
	A117	5,642,469	06/01/97	Hannaford et al.	395	99	10/10/93
	A118	5,666,138	09/09/97	Culver	345	161	11/22/94
	A119	5,694,013	12/02/97	Stewart et al.	318	561	09/06/96
	A120	5,731,804	03/24/98	Rosenberg	345	156	01/18/95
	A121	5,742,278	04/21/98	Chen et al.	345	156	11/01/95

**SUPPLEMENTAL FORM PTO - 1449  
INFORMATION DISCLOSURE STATEMENT**

ATTORNEY DOCKET NO.: MIT-051CN (5473/53)

APPLICANTS: Zilles et al.

SERIAL NO.: 10/055,565

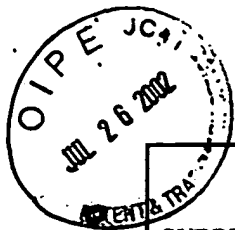
FILING DATE: October 26, 2001

GROUP: 2173

**RECEIVED****JUL 30 2002**

Technology Center 2100

	A122	5,767,839	06/16/98	Rosenberg	345	161	03/03/95
	A123	5,769,640	06/23/98	Jacobus et al.	434	262	08/10/95
	A124	5,800,177	09/01/98	Gillio	434	262	07/11/96
	A125	5,800,178	09/01/98	Gillio	434	262	07/11/96
	A126	5,800,179	09/01/98	Bailey	434	262	07/23/96
	A127	5,802,353	09/01/98	Avila et al.	395	500	06/12/96
	A128	5,803,738	09/08/98	Latham	434	29	08/05/96
	A129	5,805,140	09/08/98	Rosenberg et al.	345	161	11/17/95
	A130	5,821,920	10/13/98	Rosenberg et al.	345	156	03/28/97
	A131	5,825,308	10/20/98	Rosenberg	341	20	11/26/96
	A132	5,828,197	10/27/98	Martin, et al.	318	567	10/25/96
	A133	5,831,408	11/03/98	Jacobus, et al.	318	568.11	05/12/97
	A134	5,859,934	01/12/99	Green	382	296	01/14/97
	A135	5,880,714	03/09/99	Rosenberg et al.	345	156	01/15/97
	A136	5,889,670	03/30/99	Schuler et al.	364	186	01/11/96
	A137	5,903,456	05/11/99	Schena et al.	364	190	01/27/97
	A138	5,907,487	05/25/99	Rosenberg et al.	364	190	04/02/97
	A139	5,913,727	06/22/99	Ahdoot	463	39	06/13/97
	A140	5,929,607	07/27/99	Rosenberg et al.	320	166	04/02/97
	A141	5,929,846	07/27/99	Rosenberg et al.	345	161	06/05/97
	A142	5,956,484	09/21/99	Rosenberg et al.	395	200.33	08/01/96
	A143	6,084,587	07/04/00	Tarr et al.	345	419	02/08/96
	A144	6,191,796	02/20/01	Tarr	345	433	01/21/98
	A145	6,337,678	01/20/02	Fish	345	156	07/21/99
	A146	6,342,880	01/20/02	Rosenberg et al.	345	161	10/31/95
	A147	6,369,834 B1	04/09/02	Zilles et al.	345	701	06/02/99



**SUPPLEMENTAL FORM PTO - 1449**  
**INFORMATION DISCLOSURE STATEMENT**

ATTORNEY DOCKET NO.: MIT-051CN (5473/53)

APPLICANTS: Zilles et al.

SERIAL NO.: 10/055,565

FILING DATE: October 26, 2001

GROUP: 2173

**RECEIVED**

**JUL 30 2002**

**Technology Center 2100**

**FOREIGN PATENT DOCUMENTS**

EXA M INIT.		DOCUMENT NUMBER	DATE	COUNTR Y CODE	CLASS	SUB CLASS	FILING DATE	ABSTR ACT ONLY	ENGLISH LANG (Y/N)
	B9	WO 95/02801	01/26/95	PCT	G01B	7/03	07/12/94	N	Y
	B10	WO 97/44775	11/27/97	PCT	G09G G06G B25J G05B  G06F G06G A03B	5/08 3/00 9/18 19/19 19/408 17/00 7/48 71/00 24/00	05/16/97	N	Y
	B11	WO 98/06024	02/12/98	PCT	G06G	3/00 15/16 17/30	07/31/97	N	Y
	B12	WO 98/26342	06/18/98	PCT	G06F	15/00	11/25/97	N	Y
	B13	WO 98/30951	07/16/98	PCT	G09F	3/02	01/07/98	N	Y
	B14	WO 98/58308	12/23/98	PCT	G06F	3/033	06/15/98	N	Y
	B15	WO 98/58323	12/23/98	PCT	G06F	15/00	06/16/98	N	Y
	B16	WO 99/10872	03/04/99	PCT	G09G	5/00	08/21/98	N	Y
	B17	EP 0 915 434 A2	05/12/99	EP	G06T	15/50	05/14/98	N	Y

**OTHER ART, JOURNAL ARTICLES, ETC.**

EXAM. INIT.		OTHER DOCUMENTS: (Including Author, Title, Date, Relevant Pages, Place of Publication)
	C42	Avila et al., "A Haptic Interaction Method for Volume Visualization," GE Corporate Research & Development, Schenectady, NY, pp. 1-9 (1996).
	C43	Bergamasco, "Design of Hand Force Feedback Systems for Glove-like Advanced Interfaces", IEEE, September 1992, pp. 286-293.
	C44	Burdea, G.C., "Force And Touch Feedback For Virtual Reality," John Wiley and Sons, Inc., New York, New York, pp. 190-193 (1996).
	C45	Colgate et al., "Implementation of Stiff Virtual Walls in Force Reflecting Interfaces," IEEE Virtual Reality Annual International Symposium (Seattle, WA), pp. 202-208 (September 18-22, 1993).
	C46	Decaudin, P., "Geometric Deformation by Merging a 3D-Object with a Simple Shape," Graphics Interface '96 Proceedings (Toronto, Canada), 6 pgs. (May 21-24, 1996).
	C47	Galyean, T.A., "Sculpting: An Interactive Volumetric Modeling Technique," Computer Graphics (SIGGRAPH '91 Las Vegas), Vol. 25, No. 4, pp. 267-274 (July 1991).



**SUPPLEMENTAL FORM PTO - 1449**  
**INFORMATION DISCLOSURE STATEMENT**

ATTORNEY DOCKET NO.: MIT-051CN (5473/53)

APPLICANTS: Zilles et al.

SERIAL NO.: 10/055,565

FILING DATE: October 26, 2001

GROUP: 2173

**RECEIVED****JUL 30 2002****Technology Center 2100**

C48	Hashimoto et al., "Dynamic Force Simulator for Force Feedback Human-Machine Interaction", IEEE, September 1993, pp. 209-215.
C49	Hirota et al., "Providing Force Feedback in Virtual Environments", IEEE, September 1995, pp. 22-30.
C50	Hirota et al., "Development of Surface Display," Proceedings of the Virtual Reality Annual International Symposium (Seattle), pp. 256-262 (September 18-23, 1993).
C51	Immersion Corp., "Impulse Engine 2000," <a href="http://www.immerse.com/WWWpages/IE2000pg.htm">http://www.immerse.com/WWWpages/IE2000pg.htm</a> , 2 pgs. (1997).
C52	Ishii et al., "A 3D Interface Device with Force Feedback: A Virtual Work Space for Pick-and-Place Tasks", IEEE, September 1993, pp. 331-335.
C53	Iwata, H., "Artificial Reality with Force-feedback: Development of Desktop Virtual Space with Compact Master Manipulator," Computer Graphics (SIGGRAPH '90 Dallas), Vol. 24, No. 4, pp. 165-170 (August 1990).
C54	Kelley et al. "MagicMouse: Tactile and Kinesthetic Feedback in the Human-Computer Interface Using an Electromagnetically Actuated Input/Output Device," Department of Electrical Engineering, University of British Columbia, Vancouver, BC, V6T 1Z4, Canada, October 19, 1993, pp. 1-27.
C55	Lewis, P.H., "Electronic Pen With Its Own Eraser", Personal Computers, July, 1995, p. C8.
C56	Millman et al., "A System for the Implementation and Kinesthetic Display of Virtual Environments," Telemanipulator Technology, Proceedings of 1992 SPIE, Vol. 1833, pp. 49-56 (1992).
C57	Payne et al., "Distance Field Manipulation of Surface Models," IEEE Computer Graphics & Applications, pp. 65-71 (January 1992).
C58	Wang et al., "Volume Sculpting," 1995 Symposium on Interactive 3D Graphics (Monterey, CA), pp. 151-156 (1995).
C59	Wilson R.K., "Many-Atom Molecular Dynamics with an Array Processor", Department of Chemistry, University of California - San Diego, La Jolla, 1977, pp. 147-169
C60	Wilson R.K., "Multiprocessor Molecular Mechanics", Department of Chemistry, University of California, San Diego, La Jolla, 1975, pp. 17-52